

ESTABLISHMENT OF *BEET WESTERN YELLOWS VIRUS* ON OILSEED RAPE IN BULGARIA

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ABSTRACT

Economically the most important virus of oilseed rape (canola) – *Brassica napus* var. *oleifera* is *Beet western yellows virus* (BWYV) re-classified as *Turnip yellows virus* (TuYV). BWYV was established in oilseed rape plants from fields of the villages Galabovo and Trakia, district Dimitrovgrad, South of Bulgaria by DAS – ELISA in 2011. This is the first report about *Beet western yellows virus* (BWYV) as viral pathogen on oilseed rape in Bulgaria.

Key words: *Canola, BWYV, DAS-ELISA*

Introduction

Virus diseases decreased the yield of agricultural crops including oilseed rape (canola) – *Brassica napus* var. *oleifera*. The harvested areas occupied with this important oil-bearing culture increased in Bulgaria (from 1 083 721 dka in 2009 to 2 119 540 dka in 2010).

Economically the most important viruses of oilseed rape are *Beet western yellows virus* (BWYV), *Cauliflower mosaic virus* (CaMV) and *Turnip mosaic virus* (TuMV), [Hertel et al., 2004; Jasnic, 2007; Shahraeen, 2012] A major survey of canola crops in Western Australia in 1998 showed that BWYV was very common. BWYV was found with the incidence in 47 commercial crops from 2 to 83 % in infected plants (average 41 %) in 2002. CaMV and TuMV were much less common in canola than BWYV (Hertel et al., 2004). *Beet western yellows virus* (BWYV) was re-classified as *Turnip yellows virus* (TuYV) in 2002. Latest trials data (2009) showed that TuYV can decrease yields by up to 30 % (Stevens, 2010).

The objective of study was the establishment of new for Bulgaria harmful virus pathogens on oilseed rape.

Materials and methods

We analyzed samples of oilseed rape plants with symptoms and more rarely without symptoms of virus diseases, which were collected from crops in nine fields of five villages of the South of Bulgaria (Byalo Pole, Galabovo and Trakia - district Dimitrovgrad; Popoviza - district Plovdiv and Kolarovo - district Stara Zagora). Each sample was analyzed by us using DAS – ELISA (Clark et al., 1977) with a kits purchased from the German company LOEWE, Biochemica GmbH. The analyses were carried out with polyclonal antisera for the following viruses, causing diseases on oilseed rape: *Beet western yellows virus* (BWYV), *Cauliflower mosaic virus* (CaMV), *Turnip mosaic virus* (TuMV), *Turnip yellow mosaic virus*, *Tomato spotted wilt virus* (TSWV) and *Radish mosaic virus* (RaMV). The extinction values were measured using a spectrophotometer SUMAL PE, Karl Zeiss, Jena, Germany. All samples showing values two and a half times higher than the negative controls were assumed as virus positive. Negative controls were samples of symptomless healthy plants and positive controls the positive control from the kits.

Results and discussion

Diseased oilseed rape plants showed symptoms of yellow large areas of spotting on the leaves (Fig. 1 and Fig. 2), with shortened and tortuous stems and small racemes in 2011 (Fig. 3). *Beet western yellows virus* (BWYV) was only established in high viral concentration in oilseed rape plants from fields of the villages Galabovo and Trakia, district Dimitrovgrad (Fig. 4). The other

viruses missed. Samples 1 and 2 were from plants of Galabovo's field and sample 6 from plant of Trakia's field. BWYV infects phloem (conductive tissue) and has potential to cause stunting, reddening and stiffening of leaves resembling nutrient disorders or physiological stress (Hertel et al., 2004).

Myzus persicae Sulzer is considered as the most important vector of BWYV. Crops sown late in the autumn had less infection than ones sown early and crops with insecticide applied as early sprays or seed treatment had less infection than untreated crops (Hertel et al., 2004).

Conclusion

This is the first report about *Beet western yellows virus* (BWYV) as viral pathogen on oilseed rape in Bulgaria. The other viruses do not established in the samples of crops of five villages of the South of Bulgaria in that study.



Fig. 1 Yellowing of leaf margin and interveinal discoloration on oilseed rape (canola) – *Brassica napus* var. *oleifera*.



Fig. 2 Yellow spotting on a leaf of oilseed rape (canola) – *Brassica napus* var. *oleifera*.



Fig. 3 Shortened and tortuous stems and small racemes on oilseed rape (canola) – *Brassica napus* var. *oleifera*.

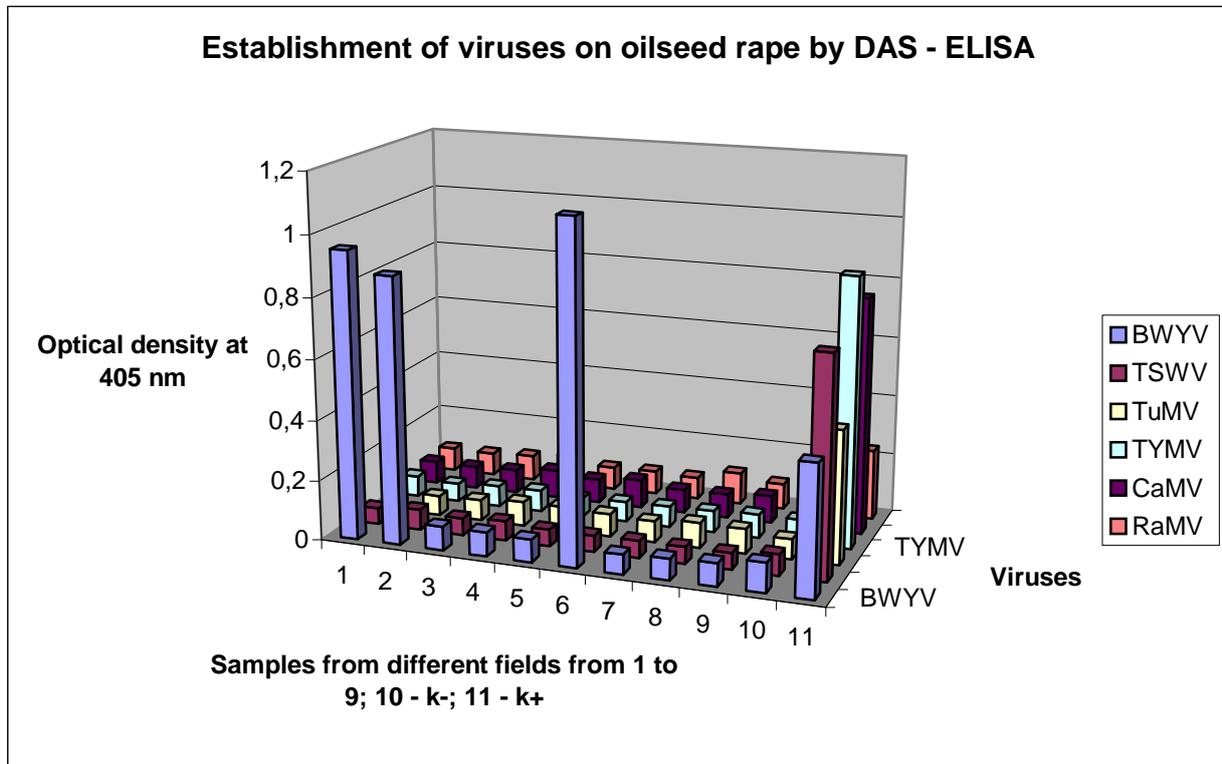


Fig. 4 *Beet western yellows virus* (BWYV), established by DAS – ELISA in 2011

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